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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,174	09/15/2006	Robert Donald Grapes	37261P121	8718

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EXAMINER
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BAYOU, AMENE SETEGNE

ART UNIT	PAPER NUMBER
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3746

MAIL DATE	DELIVERY MODE
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06/04/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/593,174	<b>Applicant(s)</b> GRAPES, ROBERT DONALD	
	<b>Examiner</b> AMENE S. BAYOU	<b>Art Unit</b> 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 September 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 3-7,9-17,19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3-7,9-17,19 and 20 is/are rejected.
- 7) ☒ Claim(s) 5 and 16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>01/09/2007 and 10/18/2006</u> .                               | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 5 and 16 are objected to because of the following informalities: claim 5 contain the phrase "claims 19", and claim 16 recites the phrase "claims 7". In both recited phrases the word "claims" should be replaced by the word "claim". Appropriate correction is required.
2. Claim 19 is objected to because of the following informality. Claim 19 begins with the letter "a" instead of "A". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that forms the basis for the rejections under this section made in this Office action.

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 19, 3-10, 12, 13, 15-17, 20 are rejected under 35 U.S.C. 102(b) as being unpatentable over Behringer et al (US patent number 5902096).
5. In re claim 19, Behringer et al'096 disclose a diaphragm pump including:
  - A pump (1), in figure 1 and 2, including a housing (10,30,50), a cavity with opposing surfaces (13 and 33), an inlet port opening (40 or 41) into the cavity, an outlet port opening (42) from the cavity, a pressure port (14) connected to the cavity, a flexible membrane (20) located within the cavity, the flexible membrane

(20) being mounted within the housing and a pre-set is applied to the flexible membrane (column 3, lines 33-40) such that the membrane adopts a first stable state (figure 5A) in contact with one of the opposing surfaces (33) of the cavity and can be caused to invert into a second stable state (figure 5C) by the application of pressure to the cavity via the pressure port (14), the bi-stable membrane (20) thereby being movable between the first (figure 5A) and second (figure 5C) stable states corresponding to completion of inlet and exhaust of a pumping cycle.

6. In re claim 3, Behringer et al'096 disclose a diaphragm pump including:
  - A pump (1) wherein the membrane (20) is formed from an elastomeric material, in figure 1 and column 3, line 45-46.
7. In re claim 4, Behringer et al'096 disclose a diaphragm pump including:
  - A pump (1) wherein the membrane (20) is formed from elastomeric sheet material, in figure 1, 2 and column 3, lines 60-62.
8. In re claim 5, Behringer et al'096 disclose a diaphragm pump including:
  - A pump wherein the membrane (20) is damped between first (30) and second (10) sections of the housing each housing section with one of the opposing surfaces (13 and 33) having a cavity section such that when the housing sections are assembled to form the housing, the cavity with opposing surfaces is formed, in figure 2.
9. In re claim 6, Behringer et al'096 disclose a diaphragm pump including:

- A pump (1) wherein a pressure port (14) opens into cavity (cavity between 13 and 33), pressure port being (14) connectable to a source or sources of positive and negative pressures, in figure 1 and column 2, lines 61-63.
10. In re claim 7, Behringer et al'096 disclose a diaphragm pump including:
- A pump (1) further including a device (2) to cyclically apply the positive and negative pressures to the cavity to cause the membrane (20) to move between the stable states, in figure 1 and column 2, lines 61-63.
11. In re claim 9, Behringer et al'096 disclose a diaphragm pump including:
- A pump (1) wherein the housing sections (10 and 30) are joined together and to clamp the membrane (20) about a peripheral margin thereof, in figures 1 and 2.
12. In re claim 10, Behringer et al'096 disclose a diaphragm pump including:
- A pump (1) wherein the first housing section (30) includes a recess (80) into which the membrane (20) is located, the peripheral dimensions of the membrane being greater than those of the recess whereby compressive forces are set up in the membrane when it is installed in the recess to thereby create the preset, in figure 1 and 2 and column 3, lines 30-50.
13. In re claim 12, Behringer et al'096 disclose a diaphragm pump including:
- A pump (1) ,in figure 1,further including a third housing section (50) coupled to the second housing section (30) , third housing section including means for facilitating connection of inlet (40) and outlet conduits (43) for pumpable material.
14. In re claim 13, Behringer et al'096 disclose a diaphragm pump including:

- A pump (1), in figure 1, wherein the second (30) and third housing (50) sections include inlet (40, 41) and outlet openings (42, 43) and means for locating therein a valve element (150,151).
15. In re claim 15, Behringer et al'096 disclose a diaphragm pump including:
- A pump (1) wherein the cavity (cavity between 13 and 33) is elongate and the pressure port (14) is offset in the length of the cavity, in figure 1 and 2.
16. In re claim 16, Behringer et al'096 disclose a diaphragm pump including:
- A pump (1) wherein the cavity (cavity between 13 and 33) is elongate and of curved cross-section, in figure 1 and 2.
17. In re claim 17, Behringer et al'096 disclose a diaphragm pump including:
- A pump (1) wherein the ends of the elongate cavity (cavity between 13 and 33) are complex curved, in figure 1 and 2
18. In re claim 20, Behringer et al'096 disclose a diaphragm pump including:
- A pump (1) wherein the clamping of the membrane (20) creates further compressive forces in the membrane, in figure 1 and column 3, lines 30-50.

### ***Claim Rejections - 35 USC § 103***

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 3746

20. Claim 11, dependent on claim 6 is rejected under 35 U.S.C 103(a) as being unpatentable over Behringer et al'096 in view of Becker (US patent number 3947156).

21. In re claim 11, Behringer et al'096 discussed disclosed the claimed invention including:

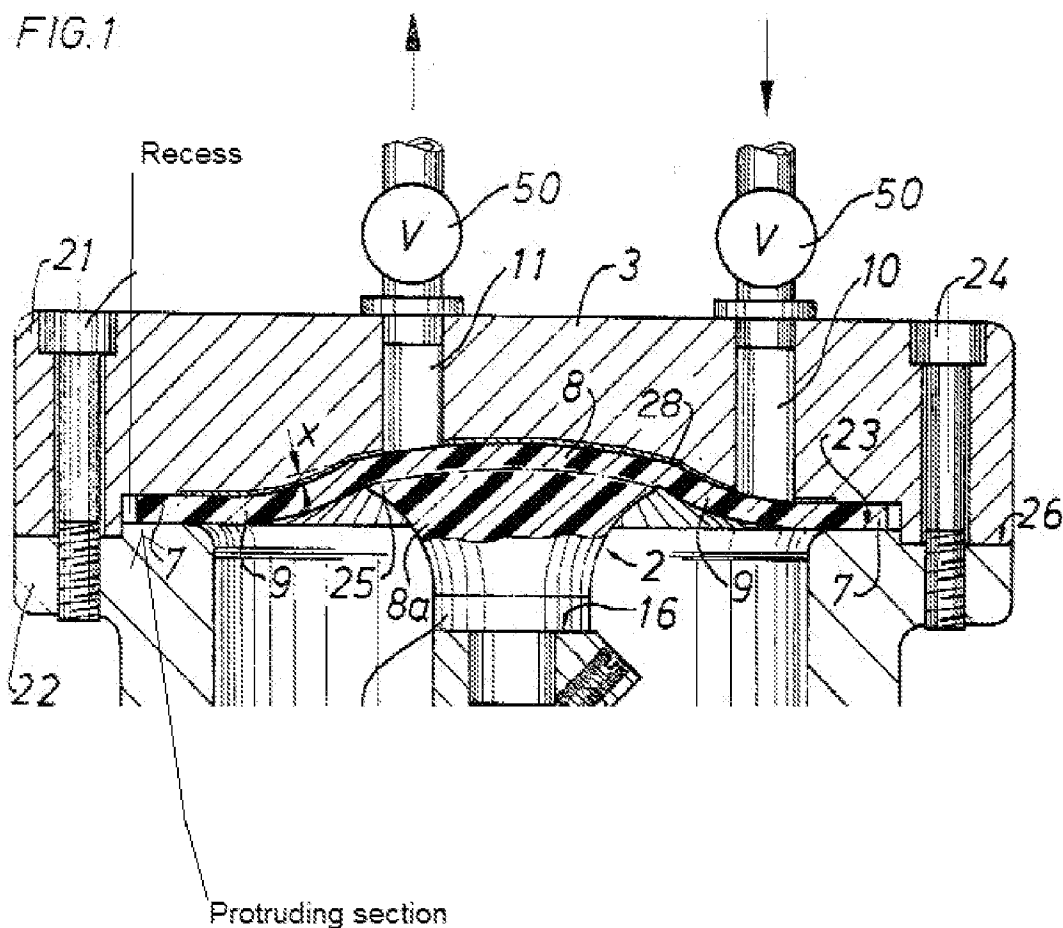
- A pump (1), the second housing section (30) which engages in the recess when the first (10) and second housing (30) sections are combined together, to cause the membrane (20) to be clamped in place, in figure 1 and 2.

But, Behringer et al'096 fails to disclose:

- The second housing section includes a protruding portion

However, Becker'156 teaches a diaphragm pump including:

- The second housing section (k) includes a protruding portion (as shown below), in figure 1.



22. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the diaphragm pump of Behringer et al'096 by making protrusion in the second housing section as taught by Becker'156 in order to have better clamping capability.

23. Claim 14, dependent on claim 13 is rejected under 35 U.S.C 103(a) as being unpatentable over Behringer et al'096 in view of Dilworth (US patent number 3900276).

24. In re claim 14, Behringer et al'096 discussed disclosed the claimed invention but



fails to disclose:

- A pump wherein the valve element is a disk of flexible material.

However, Dilworth'276 teaches a diaphragm pump method and apparatus including:

- A pump (10) wherein the valve element (74) is a disk of flexible material, in figure 1 and column 5, lines 6-7.

25. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the diaphragm pump of Behringer et al'096 by selecting a flexible disc valve as taught by Becker'156 in order to move the valve easily during opening and closing.

### ***Conclusion***

26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fujikawa (US patent number 4124008) discloses a fuel pump comprising a diaphragm. Martin (US patent number 4837068) discloses a compliant diaphragm material. Conklin (US patent number 3338171) discloses a diaphragm pump.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amene S. Bayou whose telephone number is 571-270-3214. The examiner can normally be reached on Monday-Thursday, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-

8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/  
Supervisory Patent Examiner, Art  
Unit 3746